

Electron Configuration Practice Worksheet

In the space below, write the full (unabbreviated) electron configurations of the following elements:

- 1) sodium $1s^2 2s^2 2p^6 3s^1$
- 2) iron $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- 3) bromine $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$
- 4) barium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$
- 5) neptunium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^5$

In the space below, write the Noble Gas (abbreviated) electron configurations of the following elements:

- 6) cobalt $[Ar] 4s^2 3d^7$
- 7) silver $[Kr] 5s^2 4d^9$
- 8) tellurium $[Kr] 5s^2 4d^{10} 5p^4$
- 9) radium $[Rn] 7s^2$
- 10) lawrencium $[Rn] 7s^2 5f^{14} 6d^1$

Determine what elements are denoted by the following electron configurations:

- 11) $1s^2 2s^2 2p^6 3s^2 3p^4$ sulfur
- 12) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ rubidium
- 13) $[Kr] 5s^2 4d^{10} 5p^3$ antimony
- 14) $[Xe] 6s^2 4f^{14} 5d^6$ osmium
- 15) $[Rn] 7s^2 5f^{11}$ einsteinium

Determine which of the following electron configurations are not valid: State which rule has been violated.

- 16) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$ not valid (look at 4d and 4p)
- 17) $1s^2 2s^2 2p^6 3s^3 3d^5$ not valid (fill in 3p before 3d); also: The 3s orbital can only hold 2 electrons.
- 18) $[Ra] 7s^2 5f^8$ not valid (Radium is not a noble gas)
- 19) $[Kr] 5s^2 4d^{10} 5p^5$ valid
- 20) $[Xe]$ not valid (Xe, or any other element, cannot be its own electron configurations)

Where are the Electrons?

Write the full electron configuration, short-hand electron configuration, and fill in the orbital diagrams, for the following elements.

1. Helium $1s^2$



$1s$

2. Nitrogen $1s^2 2s^2 2p^3$ $[\text{He}] 2s^2 2p^3$



$1s$



$2s$



$2p$



$3s$

3. Oxygen $1s^2 2s^2 2p^4$ $[\text{He}] 2s^2 2p^4$



$1s$



$2s$



$2p$



$3s$

4. Chlorine $1s^2 2s^2 2p^6 3s^2 3p^5$ $[\text{Ne}] 3s^2 3p^5$



$1s$



$2s$



$2p$



$3s$



$3p$

5. Sodium $1s^2 2s^2 2p^6 3s^1$ $[\text{Ne}] 3s^1$



$1s$



$2s$



$2p$



$3s$



$3p$

6. Magnesium $1s^2 2s^2 2p^6 3s^2$ $[\text{Ne}] 3s^2$



$1s$



$2s$



$2p$



$3s$



$3p$